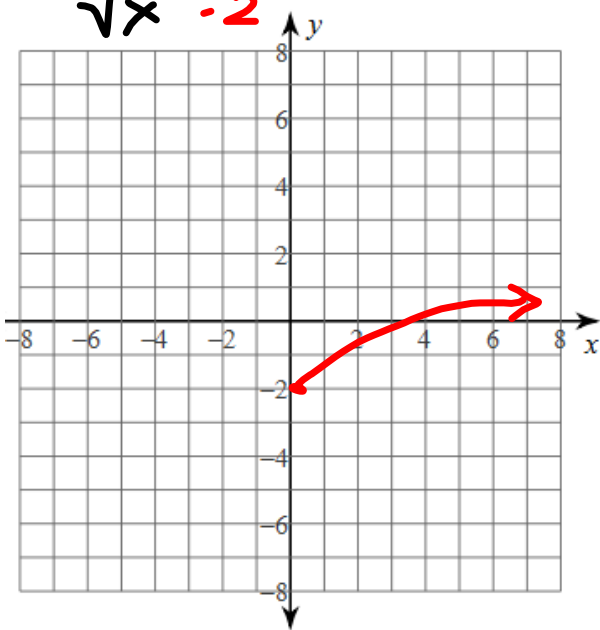
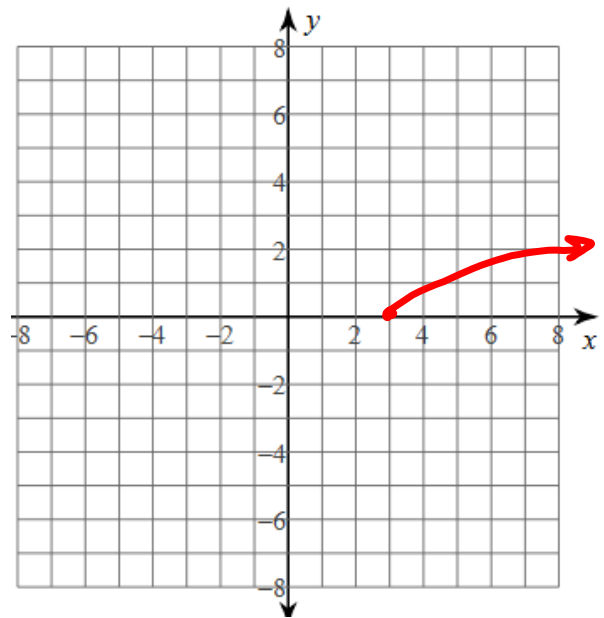


$$y = -2 + \sqrt{x}$$

\sqrt{x} -2



$$y = \sqrt{x - 3}$$



Operations with Radicals



$$\sqrt{3} + \sqrt{3}$$
$$2\sqrt{3}$$

Same index
Same Radicand



Simplify:

$$5\sqrt{2} + \sqrt{2}$$

$$6\sqrt{2}$$



Simplify:

$$7 + 8\sqrt{3} + \sqrt{3}$$

$$7 + 9\sqrt{3}$$

↑
integer
first

↑
Radical
term



Simplify: $(3 - \sqrt{7}) - (8 + 4\sqrt{7})$

$$3 - \sqrt{7} - 8 - 4\sqrt{7}$$

$$-5 - 5\sqrt{7}$$



Simplify:

$$\begin{aligned} & \sqrt{12} + \sqrt{32} + \sqrt{48} \\ & \sqrt{4 \cdot 3} + \sqrt{16 \cdot 2} + \sqrt{16 \cdot 3} \\ & 2\sqrt{3} + 4\sqrt{2} + 4\sqrt{3} \\ & \boxed{6\sqrt{3} + 4\sqrt{2}} \end{aligned}$$



Simplify: $(9 - \sqrt{18}) + (8 + \sqrt{50})$

$$\begin{array}{r} \downarrow \qquad \qquad \downarrow \\ \sqrt{9 \cdot 2} \qquad \sqrt{25 \cdot 2} \\ \underline{9} - 3\sqrt{2} + \underline{8} + 5\sqrt{2} \\ 17 + 2\sqrt{2} \end{array}$$



Simplify:

$$4(8 + \sqrt{2})$$

$$32 + 4\sqrt{2}$$



Simplify:

$$\sqrt{3}(7 - \sqrt{6})$$

$$\begin{aligned} &7\sqrt{3} - \sqrt{18} \\ &7\sqrt{3} - \sqrt{9 \cdot 2} \\ &\boxed{7\sqrt{3} - 3\sqrt{2}} \end{aligned}$$



Simplify:

$$(3 - \sqrt{7})(8 + \sqrt{7})$$

$$24 + 3\sqrt{7} - 8\sqrt{7} - \sqrt{49}$$

$$24 + 3\sqrt{7} - 8\sqrt{7} - 7$$

$$\boxed{17 - 5\sqrt{7}}$$



Simplify:

$$(3 - \sqrt{2})(3\sqrt{2} + 1)$$

$$9\sqrt{2} + 3 - 3\sqrt{4} - 1\sqrt{2}$$

$$[3 + 8\sqrt{2} - 2\sqrt{4}]$$

$$-6 + 3 = -3 \quad 3 \cdot 2 = 6$$

$$-3 + 8\sqrt{2}$$



$$\frac{\sqrt{9}}{\sqrt{4}} = \sqrt{\frac{9}{4}} = \frac{3}{2}$$

$$\frac{\sqrt{8}}{\sqrt{9}} = \frac{\sqrt{4 \cdot 2}}{3} = \frac{2\sqrt{2}}{3}$$

$$\frac{\sqrt{20}}{2\sqrt{4}} = \frac{\sqrt{4 \cdot 5}}{2 \cdot 2} = \frac{2\sqrt{5}}{4} = \frac{\sqrt{5}}{2}$$

$$\frac{\cancel{5}\sqrt{6}}{\cancel{5}\sqrt{3}} = \frac{\sqrt{6}}{\sqrt{3}} = \sqrt{\frac{6}{3}} = \sqrt{2}$$

Rationalize

$$\frac{3}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = \frac{3\sqrt{7}}{7}$$

$$\frac{4\sqrt{3}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{4\sqrt{6}}{2} = \boxed{2\sqrt{6}}$$

$$\frac{\sqrt{2} (2 + \sqrt{2})}{(2 - \sqrt{2})(2 + \sqrt{2})}$$

Rationalize: Multiply by the conjugate.

$$2 - \sqrt{2} \quad 2 + \sqrt{2}$$

$$-3 + \sqrt{5} \quad -3 - \sqrt{5}$$

$$\frac{\sqrt{2} (2 + \sqrt{2})}{(2 - \sqrt{2})(2 + \sqrt{2})}$$

$$\frac{2\sqrt{2} + 2}{4 + 2\sqrt{2} - 2\sqrt{2} - 2} = \frac{2\sqrt{2} + 2}{2}$$

$$\frac{\sqrt{2} + 1}{1} = (1 + \sqrt{2})$$

$$\frac{3\sqrt{5} + 1}{6}$$

Can NOT
be simplified